

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

Claim 1 (Currently Amended): A method comprising:

managing state information within a primary control unit included within a device, wherein the state information comprises information representing a current state of one or more ~~[[a]]~~ consumers included within the device, wherein managing the state information comprises (i) managing the state information within a temporally-ordered data structure, (ii) utilizing, for each of the consumers, a commit proposal and a commit marker pair within the temporally-ordered data structure to identify a portion of the state information for each of the consumers and (iii) setting, for each of the consumers, the corresponding one of the commit markers to identify a most recent object of the temporally-ordered data structure that has been communicated to and for which an acknowledgement has been received from the respective one of the consumers;

receiving, with the primary control unit, a change to the state information;

prior to communicating the change to the consumers of the state information included within the device, communicating to a standby control unit included within the device the change performed by the primary control unit to the state information to synchronize the state information between the primary and standby control units, wherein communicating the change to the standby control unit comprises (i) replicating the temporally-ordered data structure within the standby control unit and (ii) replicating the commit proposal and the commit marker to the standby control unit; and

after synchronizing the state information between the primary and standby control units, communicating, with the primary control unit, the change to at least one of the consumers to update consumer state information maintained within the at least one of the consumers in accordance with the portion of state information identified by the respective one of the commit proposal and commit marker pairs of the temporally-ordered data structure, wherein at least one of the consumers comprises a forwarding component of the device.

Claim 2 (Previously Presented): The method of claim 1, wherein communicating the change to the state information to the standby control unit comprises communicating the change to the state information in accordance with an order that requires the change to be communicated to the standby control unit prior to communicating the change to the consumer of the state information.

Claim 3-6 (Cancelled)

Claim 7 (Currently Amended): The method of claim 1[[6]], further comprising setting a flag that indicates to the consumer that the commit proposal has been set.

Claim 8 (Currently Amended): The method of claim 1[[6]], further comprising resetting the commit marker to the object identified by the commit proposal in response to receiving the acknowledgement.

Claim 9 (Currently Amended): The method of claim 1[[5]], wherein replicating the temporally-ordered data structure comprises further comprising:
~~replicating the commit proposal and the commit marker to the standby control unit; and~~
communicating a portion of the replicated temporally-ordered data structure that is bounded by the replicated commit proposal and the replicated commit marker to the consumer from the standby control unit in the event the primary control unit fails.

Claim 10 (Original): The method of claim 9, further comprising issuing a communication from the primary control unit to cause the standby control unit to set the replicated commit proposal to identify a most recent object of the replicated temporally-ordered data structure that has not been acknowledged by the consumer.

Claim 11 (Previously Presented): The method of claim 10, further comprising issuing another communication from the primary control unit to cause the standby control unit to set the replicated commit marker to identify a most recent object of the replicated temporally-ordered data structure that has been communicated to the consumer and for which an acknowledgement has been received from the consumer.

Claim 12 (Previously Presented): The method of claim 11, wherein issuing the other communication to cause the standby control unit to set the replicated commit marker further causes the standby control unit to set the replicated commit marker to the object identified by the replicated commit proposal in response to receiving the acknowledgement.

Claim 13 (Currently Amended): The method of claim 11, wherein utilizing the commit marker and the commit proposal further comprises deleting a least recent object of the temporally-ordered data structure that is not bounded by the commit marker and the commit proposal.

Claim 14 (Previously Presented): The method of claim 1, wherein managing the state information comprises storing the state information within a set of objects.

Claim 15 (Previously Presented): The method of claim 14,
wherein the change comprises one of a plurality of changes,
wherein receiving the changes comprises receiving event messages indicating the changes to the state information, and
the method further comprising linking the objects of the data structure in accordance with an order in which the event messages are received to form a temporally-ordered data structure.

Claim 16 (Previously Presented): A method comprising:

maintaining, with a primary control unit of a device, state information within a temporally-ordered data structure, wherein the state information comprises information representing a current state of a consumer included within the device;

communicating a portion of the state information that corresponds to a change in the state information to the consumer included within the device so as to update consumer state information maintained by the consumer with the change; and

encoding a commit proposal and a commit marker within the temporally-ordered data structure to identify the portion of the state information communicated to the consumer.

Claim 17 (Original): The method of claim 16, wherein the data structure comprises a plurality of objects, and wherein maintaining state information comprises storing the state information within the objects.

Claim 18 (Original): The method of claim 17, further comprising:

setting the commit proposal to identify a most recent one of the objects communicated to the consumer; and

setting the commit marker to identify a most recent one of the objects communicated to the consumer for which an acknowledgement has been received from the consumer.

Claim 19 (Original): The method of claim 18, further comprising setting a flag that indicates to the consumer that the commit proposal has been set.

Claim 20 (Original): The method of claim 18, further comprising:

receiving an update request from the consumer;

identifying a second portion of the temporally-ordered data structure that contains objects more recent than the object identified by the commit proposal; and

communicating state data associated with the second portion of the temporally-ordered data structure to the consumer in response to the request.

Claim 21 (Original): The method of claim 20, further comprising updating the commit proposal to identify the most recent of the identified objects of the temporally-ordered data structure.

Claim 22 (Original): The method of claim 21, further comprising:
receiving an acknowledgement from the consumer; and
updating the commit marker to identify the object identified by the commit proposal in response to the acknowledgement.

Claim 23 (Previously Presented): The method of claim 16, further comprising communicating the change to the state information to a standby control unit included within the device before communicating the changes to the consumer.

Claim 24 (Previously Presented): The method of claim 23, wherein communicating the change to the state information to the standby control unit comprises communicating the change to the state information in accordance with an order that requires the change to be communicated to the standby control unit prior to communicating the change to the consumer.

Claim 25 (Previously Presented): The method of claim 23, wherein the change comprises one change of a plurality of changes, the method further comprising:
receiving event messages indicating the changes to the state information; and
linking the objects of the data structure in accordance with an order in which the event messages are received.

Claim 26 (Currently Amended): A device comprising:

- a primary control unit;
- a standby control unit; and

aone or more consumers, wherein at least one of the consumers comprises a forwarding component,

wherein the primary control unit manages state information, receives a change to the state information, communicates the change to the state information to the standby control unit before communicating the changes to the consumers to synchronize the state information between the primary and standby control units, and after synchronizing the state information between the primary and standby control units, communicates the change to at least one of the consumers to update consumer state information maintained within the at least one of the consumers with the change, and

wherein the state information comprises information representing a current state of the consumer included within the device,

wherein the primary control unit further (i) manages the state information within a temporally-ordered data structure, (ii) utilizes, for each of the consumers, a commit proposal and a commit marker pair within the temporally-ordered data structure to identify a portion of the state information for each of the consumers and (iii) setting, for each of the consumers, the corresponding one of the commit markers to identify a most recent object of the temporally-ordered data structure that has been communicated to and for which an acknowledgement has been received from the respective one of the consumers.[:,:]

wherein the primary control unit also (i) replicates the temporally-ordered data structure within the standby control unit and (ii) replicates the commit proposal and the commit marker to the standby control unit, and

wherein the primary control unit further, after synchronizing the state information between the primary and standby control units, communicates the change to the at least one of the consumers to update the consumer state information maintained within the at least one of the consumers in accordance with the portion of state information identified by the respective one of the commit proposal and commit marker pairs of the temporally-ordered data structure.

Claim 27 (Previously Presented): The device of claim 26, wherein communicating the change to the state information to the standby control unit comprises communicating the change to the state information in accordance with an order that requires the change to be communicated to the standby control unit prior to communicating the change to the consumer.

Claim 28-30 (Cancelled)

Claim 31 (Currently Amended): The device of claim 26[[30]], wherein the commit proposal and the commit marker identify the portion of the state information within the data structure that has been communicated to the consumer.

Claim 32 (Currently Amended): The device of claim 26[[30]], wherein the primary control unit sets the commit proposal to identify a most recent object of the temporally-ordered data structure that has been communicated to the consumer, and sets the commit marker to identify a most recent object of the temporally-ordered data structure that has been communicated to the consumer and for which an acknowledgement has been received from the consumer.

Claim 33 (Previously Presented): The device of claim 32, wherein the primary control unit sets a flag that indicates to the consumer that the commit proposal has been set.

Claim 34 (Previously Presented): The device of claim 32, wherein the primary control unit further sets the commit marker to the object identified by the commit proposal in response to receiving the acknowledgement.

Claim 35 (Currently Amended): The device of claim 26[[30]], wherein the primary control unit replicates the commit proposal and the commit marker to the standby control unit and communicates a portion of the replicated temporally-ordered data structure that is bounded by the commit proposal and the commit marker to the consumer from the standby control unit in the event the primary control unit fails.

Claim 36 (Previously Presented): The device of claim 35, wherein the primary control unit issues a communication that causes the standby control unit to set the replicated commit proposal to identify a most recent object of the temporally-ordered replicated data structure that has not been acknowledged by the consumer.

Claim 37 (Previously Presented): The device of claim 36, wherein the primary control unit issues a another communication that causes the standby control unit to set the replicated commit marker to identify a most recent object of the temporally-ordered replicated data structure that has been communicated to the consumer and for which an acknowledgement has been received from the consumer.

Claim 38 (Previously Presented): The device of claim 37, wherein the other communication that causes the standby control unit to set the replicated commit marker further causes the standby control unit to set the replicated commit marker to the object identified by the replicated commit proposal in response to receiving the acknowledgement.

Claim 39 (Currently Amended): The device of claim 26[[30]], wherein the primary control unit utilizes the commit marker and the commit proposal to delete a least recent object of the temporally ordered data structure that does not include the commit marker and the commit proposal.

Claim 40 (Currently Amended): The device of claim 26[[28]],
wherein the change comprises one change of a plurality of changes,
wherein the primary control unit receives event messages indicating the changes to the state information, and links objects of the data structure in accordance with an order in which the event messages are received to form the temporally-ordered data structure.

Claim 41 (Previously Presented): The device of claim 26, wherein the primary control unit manages state information by storing the state information within a set of objects.

Claim 42 (Previously Presented): A device comprising:
a consumer;
a memory to store state information; and
a control unit to maintain the state information within a temporally-ordered data structure,
wherein the control unit communicates a portion of the state information that corresponds
to a change in the state information to the consumer so as to update consumer state information
maintained by the consumer with the change, and encodes a commit proposal and a commit
marker within the data structure to identify the portion of the state information within the
temporally-ordered data structure, and
wherein the state information comprises information representing a current state the
consumer included within the device.

Claim 43 (Previously Presented): The device of claim 42, wherein the control unit sets the
commit proposal to identify a most recent object of the temporally-ordered data structure that has
been communicated to the consumer, and sets the commit marker to identify a most recent object
of the temporally-ordered data structure that has been communicated to the consumer and for
which an acknowledgement has been received from the consumer.

Claim 44 (Previously Presented): The device of claim 43, wherein the control unit sets a flag
that indicates to the consumer that the commit proposal has been set.

Claim 45 (Previously Presented): The device of claim 43, wherein the control unit receives an
update request from the consumer, identifies a portion of the temporally-ordered data structure
that contains objects more recent than the object identified by the commit proposal, and
communicates state data for the identified objects to the consumer in response to the request.

Claim 46 (Previously Presented): The device of claim 45, wherein the control unit updates
the commit proposal to identify the most recent of the identified objects of the temporally-
ordered data structure.

Claim 47 (Previously Presented): The device of claim 46, wherein the control unit receives an acknowledgement from the consumer and updates the commit marker to identify the object identified by the commit proposal in response to the acknowledgement.

Claim 48 (Previously Presented): The device of claim 42,
wherein the control unit is a primary control unit, and the system further comprises a standby control unit, and
wherein the primary control unit communicates the change to the state information in accordance with an order that requires the change to be communicated to the standby control unit before communicating the change to the consumer.

Claim 49 (Previously Presented): The device of claim 42, wherein the data structure comprises a plurality of objects, and the control unit manages the state information by storing the state information within the objects.

Claim 50 (Previously Presented): The device of claim 49,
wherein the change comprises one change of a plurality of changes, and
wherein the control unit further receives event messages indicating the changes to the state information and links the objects of the data structure in accordance with an order in which the event messages are received.

Claim 51 (Currently Amended): A computer-readable medium comprising instructions for causing a primary control unit to:

manage state information stored within the primary control unit included within a device, wherein the state information comprises information representing a current state of one or more ~~[[a]]~~ the consumers included within the device, wherein managing the state information comprises (i) managing the state information within a temporally-ordered data structure, (ii) utilizing, for each of the consumers, a commit proposal and a commit marker pair to identify a portion of the state information for each of the consumers and (iii) setting, for each of the consumers, the corresponding one of the commit markers to identify a most recent object of the temporally-ordered data structure that has been communicated to and for which an acknowledgement has been received from the respective one of the consumers;

receive a change to the state information;

communicate the change to the state information in accordance with an order that requires the changes to be communicated to the standby control unit before communicating the changes to the consumers of the state information included within the device such that the state information is synchronized between the primary and standby control units, wherein communicating the change to the standby control unit comprises (i) replicating the temporally-ordered data structure within the standby control unit and (ii) replicating the commit proposal and the commit marker to the standby control unit; and

after synchronizing the state information between the primary and standby control units, communicate the change to at least one of the consumers to update consumer state information maintained within the at least one of the consumers in accordance with the portion of state information identified by the respective one of the commit proposal and commit marker pairs of the temporally-ordered data structure, wherein at least one of the consumers comprises a forwarding component.

Claim 52-53 (Cancelled)

Claim 54 (Currently Amended): The computer-readable medium of claim 51[[53]], wherein the instructions cause the primary control unit to:

set the commit proposal to identify a most recent object of the temporally-ordered data structure that has been communicated to the consumer; and

set the commit marker to identify a most recent object of the temporally-ordered data structure that has been communicated to the consumer and for which an acknowledgment has been received from the consumer.

Claim 55 (Cancelled)

Claim 56 (Currently Amended): The method of claim 1, wherein the device comprises a router, ~~and~~

~~wherein the consumer comprises a forwarding component.~~

Claim 57 (Previously Presented): The method of claim 16,
wherein the device comprises a router, and
wherein the consumer comprises a forwarding component.

Claim 58 (Currently Amended): The device of claim 26, wherein the device comprises a router, ~~and~~

~~wherein the consumer comprises a forwarding component.~~

Claim 59 (Previously Presented): The device of claim 42,
wherein the device comprises a router, and
wherein the consumer comprises a forwarding component.